AMENDMENTS TO THE CLAIMS

(with complete listing)

1. (Canceled)

2. (Canceled)

3. (Allowed) A method for adding upward force to a marine riser supported by a marine structure for counteracting the weight the marine riser in the marine environment, comprising:

(a) attaching at least one inflatable buoyancy module to a marine riser, said inflatable buoyancy module defining at least one internal inflation chamber and having a deflated condition and an inflated condition developing an upwardly directed buoyancy force;

(b) inflating said inflatable buoyancy module to apply an upwardly directed buoyancy force to said marine riser to reduce the effective weight of the marine riser; and

(c) inflating said inflatable buoyancy module with an uncured essentially liquid polymer foam material which subsequently cures to a substantially solid condition.

4. (Currently amended) A method for adding upward force to a marine riser supported by a marine structure for counteracting the weight the marine riser in the marine environment, comprising:

(a) attaching at least one inflatable buoyancy module to a marine riser, said inflatable buoyancy module defining at least one internal inflation chamber and having a deflated condition and a[n] distended inflated condition developing an upwardly directed buoyancy force;

(b) inflating said inflatable buoyancy module with a buoyant medium to apply an upwardly directed buoyancy force to said marine riser to reduce the effective weight of the marine riser; and

introducing a liquid composition into said inflatable buoyancy module for ballast.

5. (Allowed) A method for adding upward force to a marine riser supported by a marine structure for counteracting the weight of the marine riser in the marine environment, wherein the marine structure defines an opening having a defined dimension, said method comprising:

(a) attaching at least one inflatable buoyancy module to the marine riser, said inflatable buoyancy module being of greater external dimension when at said inflated condition as compared to the external dimension thereof at said collapsed condition and defining at least one internal inflation chamber and having a deflated condition and an inflated condition and when at said inflated condition in the marine environment developing an upwardly directed buoyancy force;

(b) with said inflatable buoyancy module at said deflated condition, moving the marine riser and said inflatable buoyancy module through the marine structure opening; and

(c) after moving the marine riser and said inflatable buoyancy module through the marine structure opening, inflating said inflatable buoyancy module to a dimension greater than the defined dimension of the marine structure opening and when submerged in the marine environment causing said inflatable buoyancy module to apply an upwardly directed force to said marine riser to reduce the effective weight of the marine riser.

6. (Allowed) The method of claim 5, wherein said inflatable buoyancy module is defined by at least two buoyancy module sections, each defining an internal buoyancy chamber, said method comprising:

(a) assembling said buoyancy module sections to the marine riser; and

(b) introducing an inflation medium into each of said internal buoyancy chambers for inflating each of said buoyancy module sections.

7. (Currently amended) A method for adding upward force to a marine riser supported by a marine structure for counteracting the weight of the marine riser in the marine environment, comprising:

(a) assembling a plurality of inflatable buoyancy modules to the marine riser in serially oriented fashion and at selective locations along the length of the marine riser, each of said inflatable buoyancy modules having at least one internal inflation chamber having a deflated condition and having a[n] distended inflated condition developing an upwardly directed buoyancy force; and

(b) selectively inflating said internal inflation chambers of said inflatable buoyancy modules for applying selective buoyancy force thereof at selective locations along the length of the marine riser and collectively reducing the effective weight of the marine riser.

8. (Currently amended) A method for adding upward force to a marine riser supported by a marine structure for counteracting the weight of the marine riser in the marine environment, comprising:

(a) assembling a plurality of inflatable buoyancy modules to the marine riser in serially oriented fashion, each of said inflatable buoyancy module defining at least one internal inflation chamber and having a deflated condition and having a[n] distended inflated condition developing an upwardly directed buoyancy force when submerged in water; and

(b) selectively inflating each of said inflatable buoyancy modules for applying the buoyancy force to the upper end of the marine riser.

9. (Currently amended) A method for adding upward force to a marine riser supported by a marine structure for counteracting the weight of the marine riser in the marine environment, wherein said plurality of inflatable buoyancy modules have an inflation control system interconnected therewith, said method comprising:

(a) attaching at least one inflatable buoyancy module to a marine riser, said inflatable buoyancy module defining at least one internal inflation chamber and having a deflated condition and a[n] distended inflated condition developing an upwardly directed buoyancy force;

(b) inflating said inflatable buoyancy module with a buoyant medium to apply an upwardly directed buoyancy force to said marine riser to reduce the effective weight of the marine riser; and

(c) actuating said inflation control system for selectively inflating each of said plurality of inflatable buoyancy modules.

10. (Allowed) The method of claim 5, wherein each of the buoyancy modules is capable of controlled expansion from a minimum dimension at said deflated condition to a maximum dimension when completely inflated and an inflation gas supply being located on said marine structure and connected by an inflation control system with said internal inflation chambers, said method comprising:

selectively and controllably actuating said inflation control system and introducing inflation gas from said inflation gas supply into said inflation chambers and inflating each of said inflatable buoyancy modules to the desired extent.

11. (Allowed) In a marine structure having a riser support and having at least one marine well production riser extending from said riser support downwardly to a subsurface riser well connection, the improvement comprising:

(a) at least one inflatable buoyancy module defining a flexible inflatable envelope and being secured to the marine well production riser and having a deflated dimension enabling its movement through small deck openings of the marine structure and an inflated condition of greater dimension as compared to the small deck openings and providing buoyancy force to the marine riser to offset the weight thereof;

(b) at least one access port being defined by said inflatable buoyancy module and having communication with said internal inflation chamber; and

(c) a buoyancy control system having a source of inflation medium for communication with said at least one access port and permitting selective flow of inflation medium from said source through said access port and into said at least one inflation chamber for desired inflation of said inflatable buoyancy module.

12. (Allowed) The improvement of claim 11, comprising:

(a) said inflatable buoyancy module having a minimum external dimension at said deflated condition thereof and a maximum external dimension at said fully inflated condition thereof; and

(b) the marine structure defining a deck opening having a defined dimension permitting passage of said inflatable buoyancy module therethrough only when said inflatable buoyancy module is at said deflated condition defining said minimum external dimension thereof.

13. (Allowed) The improvement of claim 11, comprising:

said inflatable buoyancy module being passed through said riser opening while attached to the riser during deployment of said inflatable buoyancy module and during recovery of said inflatable buoyancy module.

14. (Allowed) The improvement of claim 11, comprising:

(a) said inflatable buoyancy module having a tubular member located centrally thereof and receiving said riser therein; and

(b) said tubular member defining a riser joint connector and buoyancy module travel stops at upper and lower ends of said tubular member, said buoyancy module travel stops being disposed for force transmitting engagement with riser structure for transmission of force from said inflatable buoyancy module to the riser.

15. (Allowed) The improvement of claim 11, comprising:

a plurality of wear resistant elements being fixed externally of said flexible inflatable envelope and resisting damage of said flexible inflatable envelope during movement thereof relative to the marine structure.

16. (Allowed) The improvement of claim 11, comprising:

(a) a plurality of inflatable buoyancy modules being assembled at desired locations along the length of the riser, each of said inflatable buoyancy modules defining a least one access port; and

(b) said source of inflation medium being an inflation gas supply being connected with said access port of each of said inflatable buoyancy modules for introducing pressurized gas into said internal chamber for inflation thereof and for removing gas from said internal chamber for deflation thereof.

17. (Allowed) The improvement of claim 16, wherein:

said inflation gas supply causing independently controlled inflation of said plurality of inflatable buoyancy modules.

18. (Allowed) The improvement of claim 16, wherein:

said inflation gas supply causing simultaneously controlled inflation of said plurality of inflatable buoyancy modules.

19. (Allowed) The improvement of claim 11, wherein the marine structure defines a working opening of defined diameter, each of said inflatable buoyancy modules comprising:

(a) a longitudinal tubular element;

(b) a flexible pressure tight envelope being fixed to said longitudinal tubular element and defining at least one internal chamber, said flexible pressure tight envelope having at least one access port and being collapsible to a diameter less than the defined diameter for passage through the working opening of the spar structure and being expandable

by inflation to a diameter exceeding the defined diameter of the working opening of the spar structure.

20. (Allowed) The improvement of claim 11, comprising:

(a) a plurality of inflatable buoyancy modules being assembled at desired locations along the length of the riser, each of said inflatable buoyancy modules defining a least one access port; and

(b) said source of inflation medium being an uncured polymer inflation supply being connected with at least one of said access ports of said inflatable buoyancy modules for introducing pressurized uncured polymer into said internal chamber or at least one buoyancy module for inflation thereof, said uncured polymer subsequently curing to define at least one permanently inflated buoyancy module.

21. (Allowed) The improvement of claim 20, wherein:

said inflatable buoyancy modules each having at least two interfitting sections each defining an independent flexible pressure tight envelope and each being independently collapsible and expandable.

22. (Allowed) In a deepwater production development spar having a riser support and having at least one marine riser extending from said riser support downwardly to a subsurface riser connection, the buoyant deepwater production development spar defining a working opening having a defined diameter, the improvement comprising:

(a) at least one longitudinal tubular element defining an internal passage receiving the riser therein;

(b) at least one expandable and contractible pressure tight envelope being fixed to said longitudinal tubular element and defining at least one internal inflation chamber therein, said expandable and contractible pressure tight envelope having a deflated condition defining a diameter less than the defined diameter of the working opening permitting passage thereof

through said working opening along with the riser and an inflated condition defining a diameter greater than said defined diameter of the working opening;

(c) at least one access port being defined by said expandable and contractible pressure tight envelope and having communication with said internal inflation chamber; and

(d) a buoyancy control system having a source of inflation medium for communication with said at least one access port and permitting selective flow of inflation medium from said source of inflation medium through said access port and into said at least one inflation chamber for desired inflation of said expandable and contractible pressure tight envelope.

23. (Allowed) The improvement of claim 22, wherein the riser defines stop structure, said inflatable buoyancy modules comprising:

said longitudinal tubular element defining upper and lower module travel stops disposed for contact with the riser stop structure.

24. (Allowed) The improvement of claim 22, wherein:

(a) said longitudinal tubular element having envelope retention structure; and

(b) said flexible expandable and contractible pressure tight envelope having retained engagement with said envelope retention structure.

25. (Allowed) The improvement of claim 22, comprising:

(a) a plurality of inflatable buoyancy modules being assembled at desired locations along the length of the riser, each of said inflatable buoyancy modules defining a least one access port; and

(b) an inflation gas supply being connected with said access port of each of said inflatable buoyancy modules for introducing pressurized gas into said internal chamber for inflation thereof and for removing gas from said internal chamber for deflation thereof.